

Claims

What is claimed:

- 1 1. A method for wirelessly transmitting data between a plurality of subscriber units
- 2 and a base transceiver station, the method comprising:
- 3 at least one subscriber unit transmitting a request to send data blocks to the base
- 4 transceiver station, the request including a data transmission queue size value;
- 5 updating at the base transceiver station, a base user queue size estimate that
- 6 corresponds to the one subscriber unit that transmitted the request to send data, the base
- 7 user queue size estimate being based upon the data transmission queue size value;
- 8 the base transceiver station generating a schedule that includes time slots and
- 9 frequency blocks in which the requested data blocks are to be transmitted from the one
- 10 subscriber unit to the base transceiver station;
- 11 the at least one subscriber unit transmitting the data blocks the at least one
- 12 subscriber unit requested to send according to the schedule, each transmitted data block
- 13 comprising encoded information representing a current data transmission queue size
- 14 value;
- 15 updating the base user queue size estimate based upon the encoded information;
- 16 and
- 17 the base user queue size estimate influencing future schedules generated by the
- 18 base transceiver station.

1 2. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 1, wherein:
3 the request to send data is transmitted during a contention slot indicated within a
4 schedule previously transmitted by the base transceiver station.

1 3. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 1, wherein:
3 the data blocks comprise at least portion of a data unit, and each data unit
4 comprises encoded information representing the current data transmission queue
5 size value.

1 4. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 3, wherein the number of data units within
3 each data block is dependent on a transmission mode.

1 5. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 3, wherein encoded information comprises:
3 encoding the information within a plurality of bits within headers of the
4 data units.

- 1 6. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 4, wherein encoding the information
3 comprises:
4 calculating a number of data blocks to be transmitted, the number of data
5 blocks being dependent upon the transmission mode and the current data
6 transmission queue value.
- 1 7. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 6, wherein the number of data blocks is
3 encoded within a plurality of bits within headers of the data units.
- 1 8. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 7, wherein a range of data blocks is encoded
3 with the plurality of bits of headers of the data units.
- 1 9. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 8, wherein the range is determined through
3 a look up table depending upon the number of data blocks.
- 1 10. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 6, wherein the generated schedule includes

3 a finite number of time slots that in combination form a frame, and the
4 transmission mode can change from frame to frame.

1 11. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 1, wherein updating the base user queue size
3 estimate comprises:

4 decoding received data blocks to determine the current data transmission
5 queue value.

1 12. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 1, wherein updating the base user queue size
3 estimate comprises:

4 decoding received data units to determine the current data transmission
5 queue value, each data block comprising at least a portion of one of the data units .

1 13. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 12, wherein decoding received data units
3 comprises:

4 receiving a number that represents a number of data blocks to be
5 transferred.

1 14. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 12, wherein decoding received data units
3 comprises:

4 receiving a range of data blocks;
5 determining the current data transmission queue depending upon the
6 received range and an up-link transmission mode.

1 15. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 14, wherein the range is decoded from a
3 plurality of bits located within headers of the data units.

1 16. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 14, wherein determining the current data
3 transmission queue comprises:

4 estimating a level of up-link traffic;
5 determining the current data transmission queue based upon the range and
6 the level of the up-link traffic.

1 17. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 1, wherein the scheduling includes
3 generating a map, the map depicting time slots and frequency blocks that are

4 designated for the transmission of information between the base transceiver station
5 and the one subscriber unit, the scheduling being influenced by the base user queue
6 size value.

1 18. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 17, wherein the map includes down link
3 transmission from the base transceiver station to the one subscriber unit, and up
4 link transmission from the one subscriber unit to the base transceiver station.

1 19. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 17, wherein the map is transmitted to the
3 plurality of subscriber units once per frame of time.

1 20. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 17, wherein the map includes time slots and
3 frequency blocks for down link transmission from the base transceiver station to
4 each of the plurality of subscriber units, and time slots and frequency blocks for up
5 link transmission from each of the plurality of subscriber units to the base
6 transceiver station.

1 21. A method for wirelessly transmitting data between a transmitter and a receiver, the
2 method comprising:
3 updating at the receiver, a receiver user queue size estimate that corresponds to the
4 transmitter that transmitted a request to send data blocks, the receiver user queue size
5 estimate being based upon a data transmission queue size value of the transmitter;
6 the transmitter generating a schedule that includes time slots and frequency blocks
7 in which the requested data blocks are to be transmitted from the transmitter to the
8 receiver;
9 the transmitter transmitting the data blocks the transmitter requested to send
10 according to the schedule, each transmitted data block comprising encoded information
11 representing a current data transmission queue size value;
12 updating the receiver user queue size estimate based upon the encoded
13 information; and
14 the receiver user queue size estimate influencing future schedules generated by the
15 transmitter.

1 22. The method for wirelessly transmitting data between a transmitter and a receiver,
2 of claim 21, wherein:
3 the data blocks comprise at least portion of a data unit, and each data unit
4 comprises encoded information representing the current data transmission queue
5 value.

1 23. The method for wirelessly transmitting data between a transmitter and a receiver,
2 of claim 22, wherein the number of data units within each data block is dependent
3 on a transmission mode.

1 24. The method for wirelessly transmitting data between a transmitter and a receiver,
2 of claim 21, wherein encoded information comprises:
3 encoding the information within a plurality of bits within headers of the
4 data units.

1 25. The method for wirelessly transmitting data between a transmitter and a receiver,
2 of claim 22, wherein encoding the information comprises:
3 calculating a number of data blocks to be transmitted, the number of data
4 blocks being dependent upon the transmission mode and the current data
5 transmission queue value.

1 26. The method for wirelessly transmitting data between a transmitter and a receiver,
2 of claim 24, wherein a range of data blocks is encoded with the plurality of bits of
3 the headers of the data units.

1 27. The method for wirelessly transmitting data between a transmitter and a receiver,
2 of claim 21, wherein updating the base user queue size estimate comprises:
3 decoding received data units to determine the current data transmission
4 queue value, each data block comprising at least a portion of one of the data units .

1 28. The method for wirelessly transmitting data between a transmitter and a receiver,
2 of claim 27, wherein decoding received data units comprises:
3 receiving a range of data blocks;
4 determining the current data transmission queue depending upon the
5 received range and an up-link transmission mode.

1 29. The method for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station of claim 28, wherein determining the current data
3 transmission queue comprises:
4 estimating a level of up-link traffic;
5 determining the current data transmission queue based upon the range and the level of the
6 up-link traffic.

1 30. A method for wirelessly receiving information from a transmit unit, the method
2 comprising:

3 receiving a request to send data blocks from the transmit unit, the request
 4 including a data transmission queue size;
 5 updating a user queue size based upon the data transmission queue size;
 6 generating a schedule that includes time slots and frequency blocks in
 7 which the requested data blocks are to be transmitted;
 8 receiving the requested data blocks according to the schedule, each transmitted
 9 data block comprising encoded information representing a current data transmission queue
 10 value;
 11 updating the user queue size estimate based upon the encoded information; and
 12 the user queue size estimate influencing the generation of the next schedule.

1 31. The method for wirelessly receiving information from a transmit unit of claim 30,
 2 wherein updating the base user queue size estimate comprises:
 3 decoding received data units to determine the current data transmission
 4 queue value, each data block comprising at least a portion of one of the data units.

1 32. The method for wirelessly receiving information from a transmit unit of claim 31,
 2 wherein decoding received data units comprises:
 3 receiving a range of data blocks;
 4 determining the current data transmission queue depending upon the
 5 received range and an up-link transmission mode.

1 33. The method for wirelessly receiving information from a transmit unit of claim 32,
2 wherein determining the current data transmission queue comprises:
3 estimating a level of up-link traffic;
4 determining the current data transmission queue based upon the range and
5 the level of the up-link traffic.

1 34. A method for wirelessly transmitting information from a transmit unit, the method
2 comprising:
3 the transmit unit transmitting a request to send data blocks to a receiver unit, the
4 request including a data transmission queue size value;
5 receiving a schedule in which the data blocks are to be transmitted;
6 the transmit unit transmitting the requested data blocks according to the schedule,
7 each transmitted data block comprising encoded information representing a current data
8 transmission queue value; wherein
9 the current data transmission queue value influences the next schedule generated
10 by the base transceiver station.

1 35. The method for wirelessly transmitting information from a transmit unit of claim
2 34, wherein the request to send data is transmitted during a contention slot
3 indicated within a schedule previously transmitted by the base transceiver station.

1 36. The method for wirelessly transmitting information from a transmit unit of claim
2 34, wherein the data blocks comprise at least portion of a data unit, and each data
3 unit comprises encoded information representing the current data transmission
4 queue size value.

1 37. The method for wirelessly transmitting information from a transmit unit of claim
2 36, wherein the number of data units within each data block is dependent on a
3 transmission mode.

1 38. The method for wirelessly transmitting information from a transmit unit of claim
2 37, wherein encoding the information comprises:
3 calculating a number of data blocks to be transmitted, the number of data
4 blocks being dependent upon the transmission mode and the current data
5 transmission queue value.

1 39. The method for wirelessly transmitting information from a transmit unit of claim
2 38, wherein the number of data blocks is encoded within a plurality of bits within
3 headers of the data units.

1 40. The method for wirelessly transmitting information from a transmit unit of claim
2 39, wherein a range of data blocks is encoded with the plurality of bits of headers
3 of the data units.

1 41. A system for wirelessly transmitting data between a plurality of subscriber units
2 and a base transceiver station, the system comprising:
3 at least one subscriber unit transmitting a request to send data blocks to the base
4 transceiver station, the request including a data transmission queue size value;
5 means for updating at the base transceiver station, a base user queue size estimate
6 that corresponds to the one subscriber unit that transmitted the request to send data, the
7 base user queue size estimate being based upon the data transmission queue size value;
8 means for generating a schedule that includes time slots and frequency blocks in
9 which the requested data blocks are to be transmitted from the one subscriber unit to the
10 base transceiver station;
11 the one subscriber unit transmitting the data blocks the one subscriber unit
12 requested to send according to the schedule, each transmitted data block comprising
13 encoded information representing a current data transmission queue size value;
14 means for updating the base user queue size estimate based upon the encoded
15 information; wherein
16 the base user queue size estimate influencing future schedules generated by the
17 base transceiver station.